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Audience: College-level students

Intelligence: Heredity vs. Environment

If a set of twins were each given the task to build a bridge, which twin would build the best bridge? Let’s further the experiment by adding the variables of college and work experience. If one twin was sent to college as an architectural engineer, and the other straight into the work force, then which one would have the better knowledge? Countless studies have been conducted to find the answer to the question: Is intelligence a direct result of genetics?

The first question that must be answered to discover the causes of intelligence lies within the definition of intelligence itself. What is intelligence? Intelligence, for years, has been measured in *IQ*, or “Intelligence Quotient”. An *IQ* test compiles multiple aspects of thought, comprehension, linguistics, logic, and creativity, which are used to arrive at a number; this number, multiplied by 100, gives the *IQ* number. The test is designed to allow the score of 100 to represent the average mind (Garrett, 396). Studies have shown that of the general population, only 2% lie above the bell curve, scoring greater than a 130 (Garrett, 394). This small percentage perplexes scientists. Oftentimes, it leaves them wondering whether these tests are completely accurate.

Though the test was created first by Alfred Binet in 1905, it has been adjusted several times to account for changes in society (Garrett 394). As a whole, people have gotten smarter throughout the ages. This world is progressing in both an industrial and technological sense, exposing more and more individuals to the new ways of thinking. With an advancement in knowledge, comes an advancement in technology. How else would productivity survive, if it weren’t for people thinking in new ways? The changes also account for the 5-25 point jump in *IQ* scores seen from generation to generation (Garrett 404). In order to keep the 100 point score representative of the average person’s mind, the scoring must account for this increase in the population as a whole (Garrett 404).

Does this number really testify to a person’s intelligence, though? What about common sense versus academia? Would someone with street smarts be able to calculate taxi mileage and cost faster than a learned mathematician? The question then becomes: Is intelligence measured with the presence of common sense or with the memorization of facts and figures?

Another argument concerns savants. If an individual excels in one area beyond the average person, but is only average or below average in other areas, then is this person intelligent? The answer – sort of. While a savant may score in the lower percentile of an *IQ* test overall, he would be sufficiently above average in a specific area of the test. For example, a savant could only have a ‘nack’ for mathematics, computing figures faster than computers, but yet cannot read a simple sentence.

The requirements for being “intelligent” vary in so many ways. You could define it as having a high *IQ* score. It could also be used to describe someone who can remember directions to a certain town in a different state that he only visited once. Intelligence also could mean being able to remember every number in a county phone book. So, for the purposes of arguing whether intelligence is inherited, intelligence will be defined as the above average capabilities in overall learning potential, based on *IQ* numbers.

One of the most famous controversies dealing with intelligence is Charles Darwin’s concept of nature vs. nurture. The nature aspect infers that the process begins at birth – that basically a person is shaped by the genes he was given. On that principle, two people born with the same genetics, but put in separate living conditions, will have the same intelligence levels. This is due to the genes inherited from their parents, not the environment to which the individuals were exposed.

According to an article from The Wall Street Journal, intelligence may be a direct result of genetics, but there is no solid proof (Begley). Although genes for retardation have been specifically identified, genes for intelligence have yet to surface. The average *IQ* point jump from 5-25 points per generation is too rapid of a change to be due to genetics (The Wall Street Journal). This theory, the Flynn Theory, which states that this jump in points is due to genetics, has been marked as highly unlikely (The Wall Street Journal). By taking a look at today’s society and comparing it to 30 years ago, you will see a big socioeconomic difference; however, there’s no significant change in the gene pool. This must mean, then, that the environment takes a huge role in determining an individual’s intelligence.

However, one might argue after taking a look at a study done by S. Begley. This study was conducted by taking a group of average-minded children and a group of highly intelligent children, and comparing blood samples. They looked at the DNA strands of each subject to find differences or similarities. One thing that was found was that on the 6th chromosome, there was a gene called the Insulinlike Growth Factor 2 Receptor, or IGF2R, also referred to as the 5th allele (Begley). This gene showed up in twice as many of the children scoring highly on intelligence tests than did in the children who were considered average (Begley). However, in some of the subjects of the high-*IQ* group, this gene did not show up at all (Begley). This poses the question of whether this gene has any relevance to a person’s intelligence or not. It was found that the presence of this gene alone accounts for only a 4-point boost in an *IQ* score (Begley).

However, the IGF2R gene could still be significant due to the studies done by the National Institute of Health on insulin receptors. According to these studies, insulin receptors can help cells related to memory and learning grow (Begley). So then, the IGF2R may be significant, after-all… just not by itself. Until science can pinpoint all genes related to intelligence, then the sense that it is a genetically inherited trait is only just a hunch. It could be true that genetics account for intelligence, but this won’t be accepted as truth until it can be reliably proven.

On the other side of the table is the nurture aspect of Darwin’s theory. This concept claims that intelligence is learned. This explains a mother’s effort to eat healthy foods, exercise often, read books, and put headphones up to her stomach that play Mozart to the fetus. It is a common belief that teaching a child to read before going to school makes the child smarter. This is the same idea shared by many who take their children to Head Start programs. Studies have shown that this program helps in the long-run with areas such as arithmetic, educational attainment, and career accomplishments (Garrett, 405). Though these long-term effects are present, the average 7.42-point boost in *IQ* is only present for a short while, then slowly starts to disappear after concluding the program (Garrett, 405). So then, does this truly make a child smarter? If the program were to continue and to progress, would the *IQ* of the child also climb, or would it still diminish, proving that it can only produce a temporary affect?

Say, for example, a child went through the Head Start program, which raised his *IQ* from 120 to 128. After a year without the program, this ‘new’ *IQ* would slowly revert back to the old. However, could a child who starts with an *IQ* of 120 and uses the Head Start program and others like it throughout the course of his lifetime keep his intelligence quotient increasing or at least at a higher, stable number? Unfortunately, we cannot be sure as to what the outcome may be.

Other studies have inquired into the negative effects of the environment. When studying intelligence and infection together, it was apparent that there was a common thread. Researchers from the University of New Mexico saw that when there was much infection, such as the flu, there were low *IQ* scores (Garrett, 405). Along the same lines, they found that in places where infection was absent amongst the population, the population generally had a higher *IQ* (Garrett, 405). With this information, one can conclude that the environment does indeed have an effect on the intellect of at least a group of people. Or so it seems.

The conclusion to the study was that fighting off infectious disease exhausts the body of energy needed for the brain to develop normally (Garrett, 405). This isn’t necessarily a fact, though. It is, instead, a general consensus used to explain the findings. But this could quite possibly point to a lack of certain genes to protect intelligence. Getting sick should not lead to a decline in a person’s over-all intelligence unless there was apparent brain damage through intense fever. This shows that, yes, infection can affect an individual’s intellect; but, is this the natural shaping of the mind or is it damaging the intelligence bestowed upon the individual at birth?

With the back and forth debate, there are several theories. One theory is that intelligence is beyond a doubt inherited. This means that no matter what the circumstances, a person’s genes determine his intellectual level. It also means that environmental factors have nothing to do with how smart a person is. Another theory is that environment is the only factor in intelligence. This says that no matter what genes an individual was born with, experience and environmental factors play the only role in making or breaking a person’s intelligence. The third, and by far the most popular theory, is both. Both heredity and environment play a role in a person’s intellectual abilities.

Going back to the first scenario with the twins – now which would make the more efficient bridge? Would it be the twin who went to college, the other who went to the job sites, or would both be the same? Judging by the extensive research, the conclusion seems simply that the outcome cannot be determined a priori. Intelligence can be altered by so many variables that it makes it next to impossible to pinpoint the determining factor. An individual cannot be born without genetics and cannot be exempt from environmental effects. Therefore, intelligence, simply put, is much more complex than that.

Works Cited

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